WHAT IS CLAIMED IS:

1. In a gas turbine electric power generator having a physical speed synchronized to the electrical frequency of a power grid, the turbine including a compressor component having ganged inlet and/or stator vanes which are positioned in accordance with two or more predetermined vane positioning schedules that are a function of turbine physical speed, a method for transitioning between a first predetermined vane positioning schedule and a second predetermined vane positioning schedule, comprising the step of:

varying an angular position of the ganged inlet/stator vanes in a substantially linear fashion with respect to turbine compressor physical speed between a vane position value of a first positioning schedule and a vane position value of a second positioning schedule, wherein the change in angular position of the ganged inlet/stator vanes during a transition in turbine operation between positioning schedules is accomplished in a substantially linear fashion with respect to a change in turbine compressor speed such that an airflow volume consumed by the compressor component is modulated so as to prevent or minimize a decrease in turbine output power.

2. A method for controlling the output power of a gas turbine as set forth in claim 1 wherein a transitioning between a first and a second positioning schedule occurs whenever the power grid changes states between a normal operating condition and an under-frequency operating condition or vice versa.

3. A method for controlling the output power of a gas turbine as set forth in claim 2 wherein a predetermined nominal vane positioning schedule is used for determining the angular position of the ganged inlet and/or stator vanes during normal power grid operational conditions and a predetermined under-frequency vane positioning schedule used for determining the angular position of the ganged inlet and/or stator vanes during power grid under-frequency conditions.

4. In a gas turbine electric power generator having a physical speed synchronized to the electrical frequency of a power grid, the turbine having a compressor component using ganged inlet and/or stator vanes, a method for controlling the output power produced by the gas turbine, comprising the steps of:

varying an angular position of the ganged inlet/stator vanes in accordance with a predetermined nominal vane positioning schedule during normal power grid operational conditions;

during an onset of a power grid under-frequency condition, providing a gradual change in angular position of the ganged inlet/stator vanes with respect to compressor physical speed from operating according to the predetermined nominal vane positioning schedule to operating according to a predetermined under-frequency vane positioning schedule; and

varying the angular position of the inlet/stator vanes in accordance with the predetermined under-frequency vane positioning schedule during the power grid under-frequency condition;

wherein the gradual change in angular position of the ganged inlet/stator vanes during a transition in operation from the nominal vane positioning schedule to the predetermined under-frequency vane positioning schedule due to an under-frequency condition is accomplished in a substantially linear fashion with respect to a change in turbine compressor physical speed such that an airflow volume consumed by the compressor component is modulated so as to prevent or minimize any decrease in turbine output power.

5. A method for controlling the output power of a gas turbine as set forth in claim 4 further comprising the step of:

during a return of the power grid to normal frequency operation, providing a gradual change in angular position of the ganged inlet/stator vanes with respect to compressor physical speed during a transition in operation from the predetermined under-frequency vane positioning schedule to the predetermined nominal vane positioning schedule.

6. A method for controlling the output power of a gas turbine as set forth in claim 5 wherein the gradual change in angular position of ganged inlet/stator vanes during a transition in operation from the predetermined under-frequency vane positioning schedule to the predetermined nominal vane positioning schedule is substantially linear with respect to a change in a compressor physical speed, Nphys.

7. A method for controlling the output power of a gas turbine as set forth in claim 4 wherein the angular position of the ganged inlet/stator vanes is varied with respect to a compressor corrected speed, N_c, where:

$$N_C = \frac{Nphys}{\sqrt{\frac{T_{inlet}}{519}}}$$

and T_{inlet}= compressor inlet air temperature.